

LORD CURZON'S scheme for the reform of Indian education, referred to last week (p. 476), has been received with approval in this country, especially in so far as it condemns the dominating influence of the examination system. The whole system of education is to be reorganised with the idea of coordinating all the forces and promoting action in rational directions. A Reuter message from Calcutta states that on Monday, March 21, the Universities Bill was passed by the Legislative Council after a second sitting lasting three days. In the course of a speech upon the objects of the Bill, Lord Curzon said that the university question was a most vital, tremendous, and sacred one, and would have a profound effect upon the future of the people.

A FREE public reference library, having distinctive characteristics, is in course of formation by the London County Council at the Horniman Museum, Forest Hill. The primary intention is to encourage the study of geology and the biological sciences—especially as represented in the Horniman Museum collections—by providing the best books on these subjects, more particularly the works of admitted authority which, by reason of cost and a relatively small demand, are not ordinarily found in libraries freely accessible to the general public.

It has already been announced that the Committee of the Privy Council has agreed to recommend the scheme for the foundation of the University of Leeds on the understanding that a capital sum of at least 100,000*l.* be raised for university purposes. At a meeting of Leeds citizens held on Tuesday, it was stated that annual grants amounting to about 12,000*l.* have been promised from various public sources, but the power to utilise this additional income effectively will depend to a great extent on the raising of a sufficient capital sum to carry out the extensions. These extensions, with their equipment, will cost not less than 70,000*l.*, and an effort should be made to add at least 50,000*l.* to the endowment fund. Promises of nearly 40,000*l.* have been already received. Many of these are, however, conditional on 100,000*l.* at least being raised. The following resolution was unanimously adopted:—"That this meeting welcomes the foundation of a university upon the basis of the Yorkshire College, and expresses its earnest hope that such a capital sum will be obtained forthwith as will enable the university to carry out the important educational purposes for which it will be established."

In a lecture delivered at Owens College, Manchester, on March 15, Mr. Brudenell Carter laid down the general proposition that if ever the art of education is placed upon a scientific basis, it will properly be regarded as a department of applied physiology. Referring to the educators of to-day, Mr. Carter said that their art is purely empirical, and they work upon a basis of limited personal experience uncontrolled by scientific knowledge or by any general and admitted principles of action. They differ widely from one another on questions which should be placed beyond the reach of doubt, and there is no general recognition of any authority to which they can appeal. In these circumstances it is surely time for physiology to emerge from her seclusion and to apply herself to a systematic investigation into that which is fitting or necessary to be done. The physiologist who desires to elucidate educational problems, the lecturer remarked, is confronted by three of primary importance. The first is to ascertain the conditions which determine the greater or less strength of the brain as a whole; the second, assuming every healthy child to be adequately furnished at birth with brain cells in a rudimentary state, is to ascertain what are the conditions which call those cells into activity or which condemn them to remain only partially developed; and the third is to ascertain what circumstances determine development in one direction rather than in another.

THE Goldsmiths' Company has decided to give up the Goldsmiths' Institute at New Cross on September 29 next, and the staff have received notice that their engagements will be terminated on that date. The reasons for this decision of the company are given in a letter addressed to all members of the staff. The letter states that the funds necessary for the site, buildings, equipment, and maintenance of the institute have been provided out of the company's

private resources, and as a consequence the institute has, unlike the other polytechnic institutions in the metropolis, occupied an entirely independent position; but this independence cannot be maintained in the future, for the Education Act has constituted a single authority for the whole of London education, and this body will have supreme power over all schools and institutions maintained by public money. It is desirable that voluntary institutions such as the Goldsmiths' Institute should be coordinated with other metropolitan educational institutions. It has of late been increasingly difficult for the Goldsmiths' Institute to hold its own, and to keep pace with other institutions financed by means of charitable and public funds, and this difficulty will be greatly accentuated in the future, having regard to the fact that the cost of secondary, as well as that of primary, education will be paid for out of the rates. For these and similar reasons the Company has decided to discontinue the institute.

SIR DONALD CURRIE has given 80,000*l.* for the erection of a school of advanced medical studies in connection with University College, and in this way has removed the only impediment to the complete incorporation of University College with the University of London. In a letter to Lord Rosebery, the Chancellor of London University, and Lord Reay, president of University College, making known his generous intention, Sir Donald Currie says he gives the sum necessary for the purpose knowing that when the incorporation has been accomplished, University College "will be maintained as a centre of wide academic culture, and that anatomy, physiology (including pharmacology), biology, chemistry, physics, &c., which are subjects of preliminary and intermediate medical study, will still continue to be taught there." In addition, Sir Donald Currie has given a further 20,000*l.* to provide a suitable nurses' home and accommodation for medical students, and his daughters have given 2500*l.* to furnish the home and to secure a library for it. In thanking Sir Donald Currie for his magnificent gift, Lord Rosebery and Lord Reay point out that the donation will assist the university and the college to carry out the scheme of incorporation which it is believed will be of the highest importance to the future of university education in London, and will direct the course of the university authorities along the line of development by which London may be made the seat of a university worthy of the metropolis of the Empire.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society, March 3.**—"The Optical Properties of Vitreous Silica." By J. W. Gifford and W. A. Shenstone, F.R.S.

The authors have made a number of measurements of the optical constants of vitreous silica, which substance, owing to its uniformity of composition, to its great transparency to ultra-violet radiations, and to its not being doubly refracting like quartz, seems likely before long to play an important part in optical work.

At present it is rather costly, but this difficulty is rapidly being overcome.

The prisms used by the authors were made by processes already described in our columns (*NATURE*, vol. lxii. p. 20, and vol. lxiv. p. 45). The uniformity of the new glass was tested by building up a compound prism from four slabs of silica, prepared separately, by cementing them one above another and then cutting a prism from the mass. This was compared with a similar prism made from four pieces of borosilicate glass (Schott's No. 0.364), all from the same melting, and was found to be distinctly superior in its performance to the latter.

The paper includes a curve for a thin doublet of fluorite achromatised with vitreous silica which shows that the focal length of the combination is almost independent of the wave-length, also a list of focal lengths for a lens of fluorite and vitreous silica, and a table of the partial and proportional dispersions of fluorite, vitreous silica and quartz.

The following refractive indices for vitreous silica are recorded in the paper:—

| Wave-length                  | Index     | Wave-length                | Index    |
|------------------------------|-----------|----------------------------|----------|
| 7950 (Rb)                    | 1.453398  | 2748.68 (Cd)...            | 1.496131 |
| A' 7682.45 (Ka)              | 1.4538915 | 2573.12 „ ...              | 1.503707 |
| B' 7065.59 (He) <sup>1</sup> | 1.455180  | 2445.86 (Ag)               | 1.51096  |
| C 6563.04 (Ha)...            | 1.4564147 | 2312.95 (Cd)               | 1.519373 |
| D 5893.17 (Na)...            | 1.4584772 | 2265.13 „ ...              | 1.523053 |
| A 5607.1 (Pb)...             | 1.459507  | 2194.4 „ ...               | 1.529103 |
| E 5270.11 (Fe)...            | 1.4609945 | 2144.45 „ <sup>2</sup> ... | 1.533898 |
| F 4861.49 (Hg)               | 1.463165  | 2098.8 (Zn)...             | 1.538547 |
| G' 4340.66 (H $\gamma$ )...  | 1.4668500 | 2062.0 „ ...               | 1.54271  |
| H' 3961.68 (Al)...           | 1.470542  | 2024.2 „ <sup>3</sup> ...  | 1.54721  |
| 3610.66 (Cd)                 | 1.475112  | 1988.1 (Al)...             | 1.551990 |
| 3302.85 (Zn)...              | 1.480610  | 1933.5 „ <sup>4</sup> ...  | 1.55998  |
| 3034.21 (Sn)...              | 1.486881  | 1852.2 „ ...               | 1.5743   |

Temperature Refraction coefficient for D for 1° C. — 0.00000346.

Note.—The number of figures in each index indicate the estimated freedom from errors of observation. The following interpolated indices (see focal curves) are in all probability more correct for the wave-lengths given:—

1 1.45516.      2 1.53392.      3 1.54728.      4 1.56003.

**Royal Astronomical Society, March 11.**—Prof. H. H. Turner, president, in the chair.—The secretary gave a short account of a paper by Prof. Ernest W. Brown on the degree of accuracy of the new lunar theory, and on the final values of the mean motions of the perigee and node.—An account was also given of a paper by Mr. E. Nevill on the comparison between the purely theoretical and observed places of the moon, containing some criticisms of Mr. Cowell's note on the errors of the moon's tabular longitude published in the November number of the *Monthly Notices*.—Prof. Turner read a note on the instrumental errors affecting observations of the moon, in which he concluded that it seems probable that meridian instruments may give very different values for the parallactic inequality, and that the results derived by Mr. Cowell, especially that for the sun's parallax, must, until these instrumental errors have been more fully discussed, be received with caution.—Mr. Cowell read a paper on methods of analysis of the moon's errors, with some results.—The *Astronomer Royal* described the volume of the Greenwich Astrographic Catalogue, now in course of publication. The determination of positions and magnitudes of the stars was discussed, and the probable errors of photographic star places compared with those obtained from meridian observations.—Mr. Furner read a paper by Mr. Storey and himself on the absolute proper motions of certain double stars showing large relative motion.—Mr. Maunder read a paper by Mrs. Maunder and himself on the date of the passage of the vernal equinox from Taurus into Aries, illustrated by photographs of Babylonian tablets.—Other papers were taken as read.

**Royal Meteorological Society, March 16.**—Captain D. Wilson-Barker, president, in the chair.—Mr. Richard H. Curtis delivered a lecture on water-vapour.

#### PARIS.

**Academy of Sciences, March 14.**—M. Mascart in the chair.—On the solubility of silicon in zinc and lead: Henri Moissan and F. Siemens. Silicon commences to dissolve in zinc at a temperature of about 550° C., and at 850° C. the molten metal contains about 1.62 per cent. of silicon. As the temperature increases the solubility increases very rapidly. Silicon commences to dissolve in lead at a much higher temperature than in zinc, about 1100° C., and only 0.79 per cent. is dissolved at the boiling point of the lead. The results are expressed in the form of curves.—On a new mode of formation of calcium carbide: Henri Moissan. By the electrolysis of fused calcium chloride, or better, of a mixture of fused calcium fluoride and chloride, in a graphite crucible, the metallic calcium formed combines

partially with the carbon, forming calcium carbide. The yield is poor, but the observation is interesting, since the carbide is formed in this reaction at a temperature as low as 650° C.—Observations concerning the mode of fructification of the Cycadofilicinae: R. Zeiller. A discussion of the bearing of some recent work by R. Kidston on the views of M. Grand'Eury. It is pointed out that the gymnosperms held a much more important place in the formation of the Coal-measures than has hitherto been supposed.—The comparative actions of heat and the *n*-rays on phosphorescence: R. Blondlot. It is known that a rise of temperature increases the intensity of phosphorescence of a faintly luminous screen, but a comparison of this effect with that of the *n*-rays on a similar screen shows important differences. Thus, whilst the *n*-rays increase the quantity of light emitted normally by the screen, they diminish the amount emitted obliquely. The effect of heat, on the other hand, is to increase the light emitted in all directions. An experiment is described by means of which the two effects can be compared on the same screen.—On the paludian character of the plants which form combustible fossils of all ages: M. Grand'Eury.—Note by M. Bertin accompanying the presentation of an Italian marine atlas published by M. Corazzini.—On an experiment made by the Suez Company for the suppression of malaria by the destruction of mosquitoes: Prince d'Arenberg. By the adoption of the preventive measures indicated by Ross and Laveran the mosquitoes in the Ismaïlia district have been practically destroyed. As a consequence, a very marked diminution in the number of cases of malaria has resulted.—M. Volterra was elected a correspondent in the section of geometry in the place of M. Cremona, M. Brögger a correspondent in the section of mineralogy in the place of M. Carl von Zittel, and M. Flahault a correspondent in the section of botany in the place of M. Millardet.—On perfect ensembles and uniform functions: M. Zoretti.—On the optical measurement of the difference between two thicknesses: A. Perot and Ch. Fabry.—New laws relating to the anomalous propagation of light in optical instruments: G. Sagnac.—On the amount of energy set free in a receiving antenna at different distances: C. Tissot. By modifying the method described in a previous paper, the author has been able to obtain a bolometer giving a much higher sensitiveness as a detector of the Hertzian waves. A comparison of the energy received at different distances showed that this probably varies as the inverse square of the distance of the receiver from the sending station.—On the disappearance of the radio-activity induced by radium on solid bodies: P. Curie and J. Danne. The intensity of the induced radiation can be expressed as a function of the time as a difference of two exponentials. These results can be explained theoretically by adopting the views of Rutherford, who supposes that the emanation, acting on the solid walls, creates a radio-active substance which disappears according to a simple exponential law. In disappearing this gives rise to a new radio-active substance, also following a simple exponential law, with a different coefficient.—On the natural rotatory power of certain bodies for the *n*-rays: H. Bagard. The rotatory power of solutions of sugar, tartaric acid, and of turpentine for eight groups of *n*-rays has been examined, the rays being distinguished by their refractive indices through aluminium and by their wave-length (Blondlot). For turpentine and sugar, the rotations are in the same sense as with ordinary light, and are normal in that the rotation varies in the inverse sense with the wave-length. For tartaric acid, which produces a dextro-rotation with ordinary light, the rotation is to the left with the *n*-rays. The rotations observed with the latter are several hundred times greater than with ordinary light; thus a solution giving +4° 42' in a column of 20 cm. length with ordinary light gave -138° with *n*-rays in a column only 0.055 cm. long. It was found that the rotations produced were proportional to the thickness of the solution within the limits of experimental error.—Bishop's circle for 1902-1904: F. A. Forel.—Simple demonstration of the phase rule: A. Ponsot.—On an apparatus designed to act as a regulator for a water pump: J. Meunier.—The action of carbonic acid upon solutions of sodium nitrite: C. Marie and R. Marquis. Fresh experiments are adduced in support of the view that nitrous acid is set free from nitrites by the

action of carbonic acid, in reply to the criticisms of M. L. Meunier.—On some derivatives of  $\alpha$ -campholytic acid and of  $\alpha$ -campholenic acid: G. **Blanc** and M. **Desfontaines**.—A method of preparation of aldehydes and the systematic degradation of acids: E. E. **Blaise**.—On a general method of synthesis of the aldehydes: F. **Bodroux** (see p. 496).—A method of estimating vegetable proteids: L. **Beulaygue**.—On two new larval forms of *Thrombidium*, parasites of man: F. **Heim** and A. **Oudemans**. The names *T. striaticeps* and *T. periceps* are proposed for the new species, which are described in detail, with illustrations.—On some experiments carried out in the laboratory in the catacombs of the Natural History Museum: Armand **Viré**. A study of the modifications produced in animals kept in total darkness.—On a new *Cerianthus*: Louis **Roule**.—On the secretory mechanism producing pearls: Raphael **Dubois**. The formation of the pearl cannot be considered as due to a simple ordinary secretion, the organic skeleton and the calcium carbonate not being secreted by the same element.—On the distribution of the chemical elements in the earth and its possible relation with the atomic weights: L. **de Launay**. From the considerations adduced by the author it would appear that whilst the earth was still in a fluid state the elements already constituted arranged themselves at distances from the centre which were greater as the atomic weights were smaller, as if, in fact, the atoms, absolutely free from all chemical affinity at such high temperatures, had obeyed, in a fluid sphere in rotation, a central attraction combined with centrifugal force.—On a new variety of orthose: L. **Duparc**.—The generalisation, by means of the nerves, of the action of the  $n$ -rays applied to a point of the organism: Augustin **Charpentier**.—The insufficiency of development of toxic origin: MM. **Charrin** and **le Play**.—The action of formaldehyde on milk: A. **Trillat**. The casein of milk is rendered absolutely insoluble by the action of very small amounts of formaldehyde. At the same time the antiseptic is not fixed by the albumenoid, and is free to exert its well known injurious effects when taken into the digestive system. The effect of the addition of this antiseptic to milk is thus doubly injurious.—On the essence of *Artemisia herba alba*: E. **Grimal**.

## GÖTTINGEN.

**Royal Society of Sciences.**—The *Nachrichten* (physico-mathematical section), part vi., 1903, contains the following memoirs communicated to the society:—

October 31, 1903.—S. **Nakamura**: On the law of the velocity of light in tourmaline. R. A. **Houstoun**: On the action of a transitional stratum in total reflection.

November 28, 1903.—G. **Herglotz**: Contribution to the theory of electrons.

December 12, 1903.—H. **Gerdien**: Measurements of the electrical conductivity of free air during four balloon ascents.

The *Proceedings* of the society include a discourse, by Prof. Verworn, on natural science and cosmical theory; an address of congratulation on his jubilee to Dr. Lipschitz, of Bonn; and a note by F. Klein and K. Schwarzschild on a recently published portrait of Gauss at the age of twenty-six, which they decide to be in reality a portrait of Bessel.

## DIARY OF SOCIETIES.

## THURSDAY, MARCH 24.

ROYAL SOCIETY, at 4.30.—Croonian Lecture, on the Chemical Regulation of the Secretory Process: Prof. E. H. Starling, F.R.S., and Dr. W. M. Bayliss, F.R.S.

INSTITUTE OF ELECTRICAL ENGINEERS, at 8.—Direct Reading Measuring Instruments for Switchboard Use: K. Edgcombe and F. Punga.

## FRIDAY, MARCH 25.

ROYAL INSTITUTION, at 9.—Liquid Hydrogen Calorimetry: Prof. Dewar, F.R.S.

PHYSICAL SOCIETY, at 5.—Note on the Measurement of Small Inductances and Capacities and on a Standard of Small Inductance: Prof. J. A. Fleming, F.R.S.—A Hot-wire Ammeter for Measuring very small Alternating Currents: Prof. J. A. Fleming, F.R.S.—The Energy of Secondary Röntgen Radiation: C. G. Barkla.

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INSTITUTE OF CIVIL ENGINEERS, at 8.—The Relative Advantages of Continuous and Alternating Current for Traction Purposes: J. M. Kennedy.

## SATURDAY, MARCH 26

ROYAL INSTITUTION, at 3.—The Life and Work of Stokes: Lord Rayleigh.

## MONDAY, MARCH 28.

INSTITUTE OF ACTUARIES, at 5.—On the Valuation of Whole-life Industrial Assurances, with Allowance for Lapses: T. G. Ackland and J. Bacon.

## TUESDAY, MARCH 29.

INSTITUTE OF CIVIL ENGINEERS, at 8.—Lowering the Sill of the Ramsden Dock, Barrow-in-Furress: L. H. Savile.—Burntisland Harbour; Construction of the East Dock: R. Henderson.

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